

**U.S. Environmental Protection Agency
Office of Research and Development**

**BOARD OF SCIENTIFIC COUNSELORS
GLOBAL CHANGE SUBCOMMITTEE**

**Conference Call Summary
August 4, 2005
10:00 a.m.–12:00 p.m. EDT**

Welcome

Milton Russell, Ph.D., Chair, Global Change Subcommittee

Dr. Milton Russell, Chair of the Global Change Subcommittee, welcomed the participants and reviewed the agenda for the conference call, which included a brief discussion of its purpose, an introduction of the Subcommittee members, and a review of the Federal Advisory Committee Act (FACA) guidelines. Also included were Dr. Kevin Teichman's overview of the Office of Research and Development (ORD), Dr. Joel Scheraga's presentation on the Global Change Research Program, a discussion of the Subcommittee's charge questions, and suggestions for organizing the draft report. Dr. Janet Gamble, Designated Federal Officer (DFO) for the Global Change Subcommittee, reviewed administrative issues and action items, and time was allotted for public comment. The agenda for the conference call is included as an appendix.

Prior to the conference call, Dr. Gamble had distributed short biographies of each Subcommittee member. Dr. Russell asked the members to say a few words about themselves and why they were interested in the Global Change Research Program.

Dr. John Balbus, Director of the Health Program for Environmental Defense, began by describing his background in clinical medicine and public health. Before coming to Environmental Defense, he spent 7 years at George Washington University. He was most involved with the health effects of global change from 1994 to 2000, when he participated in the first United Nations Environment Programme (UNEP) and U.S. Environmental Protection Agency (EPA) programs on conducting global assessments. This work included writing chapters on how to conduct health risk assessments for global climate change in the first UNEP workbook. During the past few years, his organization has made taking action on global climate change its highest priority. Dr. Balbus considers this program review to be an important part of the federal government's effort to determine the right decisions and actions on climate change, and he was looking forward to participating.

Dr. Chuck Coutant, a senior research ecologist with the Oak Ridge National Laboratory (ORNL), remarked that much of his career has focused on the temperature effects on aquatic systems and water resources, including reservoirs in the southeastern United States and salmon resources in the Pacific Northwest. During the past 15 years, Dr. Coutant has advised the Salmon Restoration Program as an independent reviewer/observer. He has been involved with climate change issues

both peripherally and directly. He explained that much of the temperature effects work over the past 30 years was related to power plants and thermal pollution issues; however, much of the recent application of this work has been toward issues of climate change, general global warming, and their effects on aquatic systems around the world. Dr. Coutant has advised EPA on issues related to temperature effects and ecosystems research, particularly temperature effects for Regions 1 and 10. Currently, there are many programs at ORNL in the area of global climate change, and Dr. Coutant stays involved in these efforts. Several years earlier, he managed work in this field for the U.S. Department of Energy (DOE). Dr. Coutant added that he was pleased to be able to help EPA address climate change issues.

Dr. Clifford Duke is the Science Director for the Ecological Society of America (ESA), a professional scientific society. He also serves as a liaison between the Subcommittee and the Board of Scientific Counselors (BOSC) as a member of the BOSC Executive Committee. His scientific background is in aquatic ecology. Before coming to ESA, Dr. Duke worked on National Environmental Policy Act (NEPA) documents and ecological risk assessments as a consultant to federal agencies, including DOE and the U.S. Department of Defense.

Dr. Robert Wilkinson currently is with the University of California at Santa Barbara. Most of his work in global change was through the National Assessment, for which he coordinated the California component and contributed to the overall National Assessment. Recently, his work has involved water systems and water policy related to the potential impacts of climate change on the water supply and, to an extent, on water quality.

Ms. Claudia Nierenberg has been with the U.S. Global Change Research Program (USGCRP) since 1991 in various capacities at the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA). She explained that she has watched the USGCRP struggle with its identity as an earth science program, trying to design science research that has decision relevance and begins to “mainstream” the climate topic as a public policy issue. Currently, Ms. Nierenberg is the Acting Director for the Climate and Societal Interactions Division. She has a Masters degree in international economic policy and came to NOAA when it was building the International Research Institute for Climate Prediction, which now is at Columbia University. This institute will be dedicated to the developing world, and will examine the climate and environmental roots of poverty. Its programs have grown considerably. She is interested in the connections between the mission agencies and the U.S. Climate Change Science Program (CCSP) and how they can begin to move the research toward climate services and decision support outcomes.

Dr. Russell remarked that he always has been interested in the use of science in public decision making, especially in long-term issues with great uncertainties and potentially high consequences. He commented that global change is a key issue, and he is excited to participate, see some of the science in action, and meet with the scientists who are exploring some of these issues.

Dr. Russell introduced Dr. Duke’s presentation.

The Purpose of the Global Change Subcommittee

Clifford Duke, Ph.D., Science Director, ESA

Dr. Duke serves as Vice-Chair of the Global Change Research Subcommittee and also is a member of the Executive Committee of the BOSC, an advisory committee to ORD, chaired by Dr. James Johnson of Howard University. He noted that Ms. Lorelei Kowalski, DFO for the BOSC Executive Committee, also was on this call. Dr. Duke explained that the BOSC provides several types of reviews for EPA and sponsors various kinds of symposia. The BOSC's activities often result from EPA requests or from the interests of those on the BOSC Executive Committee. One of the major activities that the BOSC has undertaken recently has been the research program reviews. Recent programs that have undergone review include the Particulate Matter and Ozone Research Program, the Human Health Research Program, the Ecological Research Program, and the Endocrine Disrupting Chemicals Research Program. A program review is anticipated for EPA's Science To Achieve Results (STAR) Program.

Dr. Duke explained that some reviews are staffed entirely or nearly entirely by the Executive Committee members, depending on their expertise. At times, experts are brought in to form subcommittees, as in the present case. For each report generated by these program reviews, Dr. Johnson typically appoints two Executive Committee members to serve as lead report reviewers. Everyone on the Executive Committee will be expected to review the Subcommittee's report; however, the lead reviewers examine the report more thoroughly and lead the Executive Committee's discussion of the report.

The Executive Committee plans to discuss this program review report at its January 2006 meeting. Dr. Russell will be invited to attend in person or by telephone; the Chair usually is present to discuss the review. Following discussion of the report and after the Subcommittee has made any requested changes, the Executive Committee will vote to approve the report, which will be transmitted formally as a BOSC report to ORD. Dr. Duke explained that, as a member of the Subcommittee, he will be recused from voting on the report's approval, but he can be present during the discussion to provide further information.

FACA Guidelines

Janet Gamble, Ph.D., NCEA, ORD, EPA

Dr. Russell thanked Dr. Duke and introduced Dr. Gamble's presentation on the FACA guidelines. Dr. Gamble thanked Drs. Russell and Duke and the Subcommittee members for their time and effort on this review and their valuable service to EPA. She also thanked the EPA staff and any members of the public that might be participating.

Dr. Gamble described the BOSC as a federal advisory committee that provides independent scientific peer review and advice to ORD. The Global Change Subcommittee was established by the BOSC Executive Committee to review the Global Change Research Program. The Subcommittee was asked to respond to charge questions and to provide a report to the BOSC Executive Committee for its deliberations. The Executive Committee has the authority to evaluate the Subcommittee's report and submit it to ORD. Whereas the role of the BOSC is to

provide advice and recommendations to ORD, the rights of decisionmaking and program implementation remain with the Agency.

This is the Subcommittee's first meeting; a second conference call is planned for Tuesday, September 13, 2005, and a face-to-face meeting is scheduled for Monday, September 26, through Wednesday, September 28, in the Washington, DC, area at the Hilton Alexandria Old Town. These three meetings were listed in the *Federal Register* earlier in July. Additional meetings may be scheduled as needed. An additional conference call may be held in October or November, following the face-to-face meeting. Announcements for any subsequent conference calls will be placed in the *Federal Register* at least 15 days before the scheduled dates.

Dr. Gamble explained that the DFO serves as the liaison between the Subcommittee and the Agency. Serving in this role, Dr. Gamble is responsible for ensuring that the Subcommittee and its meetings comply with the FACA guidelines. She summarized a few FACA rules. All meetings involving substantive issues, whether in person, by phone, or by e-mail, are open to the public. This applies to all group communications that include at least one-half of the Subcommittee members. Issues that are preparatory or administrative in nature are exempt from this requirement. A *Federal Register* notice must announce all meetings at least 15 calendar days in advance of the meeting, and the DFO must approve the agenda for all meetings and attend all meetings. The meeting minutes must be certified by the Chair within 90 days of the meeting, and all advisory committee documents must be made available to the public.

The Subcommittee provides advice in the form of a draft report to the Executive Committee. Dr. Gamble requested that she be copied on any e-mail correspondence from the Chair to the Subcommittee; however, there is no need for workgroups comprising less than one-half of the Subcommittee members to copy her on e-mails about technical matters. Questions about particular details will be handled as they arise. Dr. Gamble has worked with EPA officials to ensure that all appropriate ethics regulations have been satisfied; each Subcommittee member has filed a standard government financial disclosure report. To ensure that all ethics requirements were met, these reports were reviewed by the Deputy Ethics Officer for the Office of Science Policy (OSP) and the DFO in consultation with the Office of the General Counsel. In addition, Subcommittee members have completed annual ethics training.

This meeting agenda included time for Agency presentations, Subcommittee questions, group discussion, and public comment. Detailed minutes were taken and will be available on the BOSC Web Site, once they have been certified by the Chair. To ensure the accuracy of the minutes, Dr. Gamble requested that all participants identify themselves before speaking. No members of the public requested time to comment or asked for information about the Subcommittee and its deliberations. Any such requests would be handled at the end of the meeting; each individual's comments would be limited to 3 minutes. The public docket for the meeting can be accessed at www.epa.gov/edocket. The edocket number is ORD-2005-0023. Dr. Gamble said she would provide additional information about logistics and the operation of the Subcommittee at the end of the meeting.

The charge to the Global Change Subcommittee was presented by the BOSC Executive Committee; the charge questions were developed so that the Subcommittee's feedback could be

of greatest use to the Agency. These questions address a broad range of topics, including management and scientific issues, and are intended to be both prospective and retrospective in nature. The Subcommittee's review will be shaped by the spectrum of expertise of the Subcommittee members. Dr. Gamble requested that Subcommittee members ask questions to clarify any ambiguities and identify any additional materials that may be helpful in performing this review. The Chair will provide additional materials by e-mail. Dr. Gamble recommended that the Subcommittee determine writing assignments and begin to develop an outline for the report. The Subcommittee is expected to produce a draft report following the face-to-face meeting and a draft final report after the October or November conference call. This draft final report will be presented to the BOSC Executive Committee for deliberation at the January 2006 Executive Committee meeting. She commented that this is an ambitious schedule. She thanked the Subcommittee members again, and added that the Agency is eager to receive their advice.

Dr. Coutant asked about the relationship between the BOSC and the EPA Science Advisory Board (SAB). Drs. Gamble and Duke deferred to Ms. Kowalski, who explained that the SAB and the BOSC Executive Committee both are FACA committees. EPA has approximately 24 FACA committees throughout the Agency. The BOSC was established when ORD reorganized in 1995. Its purpose is to provide advice and counsel to ORD only; the SAB provides advice and counsel throughout EPA.

Introduction to ORD

Kevin Teichman, Ph.D., OSP, ORD, EPA

Dr. Teichman described ORD as a sizeable organization, with nearly 2,000 employees and a budget of approximately \$600 million. Of that budget, approximately \$70 million is spent on extramural research grants, primarily to academia, through the National Center for Environmental Research (NCER). ORD has 13 locations across the country, including three laboratories and four centers.

ORD's intent is to provide credible, relevant, and timely research results that inform EPA's decisionmaking. For example, if the EPA Administrator is being briefed by a Program Office about a new regulation, he or she will go around the table and ask the lawyers if it is legally defensible and ask the enforcement office if it can be enforced by the states. He or she then will ask Dr. Teichman or his manager if the science underpinning this regulation is properly represented, whether it has been stretched to meet a policy aim, or if it is sound science. The intent is to have science results that truly inform decisionmaking in the Agency and, on a topic as broad as climate change, throughout the Administration.

ORD's mission is to advance scientific knowledge to solve the environmental problems facing the Agency. This includes conducting research and providing technical advice and assistance to program offices and regional offices as they develop and implement policies. The mission also includes providing scientific leadership, nationally and internationally, to advance environmental science.

The Global Change Research Program is tied intimately to EPA's mission, which is to protect human health and the environment. This mission is accomplished by program offices, which are

responsible for writing national policies. These policies may be voluntary programs or regulations. There are four major program offices: the Office of Air and Radiation (OAR), the Office of Water (OW), the Office of Solid Waste and Emergency Response, and the Office of Pesticides and Toxic Substances. The program offices are one of ORD's most important clients for research results. For example, the research of the Global Change Research Program will help to inform OAR as it develops policies related to climate change. The 10 regional offices are another important ORD client. Their primary responsibility is to implement the national policies developed at Headquarters, working with the states to achieve the desired environmental outcomes. ORD has a strong connection to the program and regional offices and a direct role in supporting EPA's mission by contributing to the scientific foundations for EPA's decisions and future environmental sciences.

Dr. Teichman presented ORD's organizational chart. The Assistant Administrator (AA) for ORD currently is Mr. Tim Oppelt. The President has nominated Mr. George Gray of Harvard University for this position. There are two Deputy Assistant Administrators (DAA); Dr. William Farland is the DAA for Science, and Mr. Lek Kadeli is the DAA for Management. The Office of Resources Management and Administration handles the budgeting and the policies and procedures for managing ORD. Dr. Teichman's office, OSP, coordinates the BOSC and other similar cross-Agency activities and has a major role in policy review. For example, OSP coordinates activities such as providing scientific input to the Administrator. OSP also coordinates views across ORD on the science that underpins regulations that are under consideration by the Administrator. This role is taken very seriously.

The research laboratories and centers are based along the risk assessment paradigm. Accordingly, there is an exposure laboratory, an effects laboratory (which works on both health and environmental effects), and the National Center for Environmental Assessment (NCEA), which conducts risk assessments or environmental assessments. There also is a risk management laboratory that not only provides information on source emissions, for example, but also tries to develop risk-management strategies to abate those risks. Through NCER, a certain percentage of the research budget is awarded competitively to different institutions as a way of complementing the expertise in ORD's laboratories and centers. ORD has two new centers, the National Homeland Security Research Center and the National Center for Computational Toxicology, which works on genomics and bioinformatics and helps to further the understanding of how to screen for chemicals and anticipate potential environmental effects.

Dr. Teichman explained that, for the Subcommittee's review of the Global Change Research Program, it is not necessary to know which laboratory is doing what research. It is more important to have an overall idea of ORD's activities to determine whether ORD is covering the scientific questions that need to be addressed. ORD recently established National Program Directors (NPDs). Dr. Scheraga, the NPD for the Global Change Research Program, is responsible for evaluating the entire area of global change to: (1) identify the program and regional offices' science needs; (2) determine any opportunities for ORD to be a science leader; and (3) understand how EPA's effort fits into the overall global change research effort in the federal government. Dr. Teichman commented that this is a very ambitious role, and ORD is glad to have Dr. Scheraga in that capacity.

Next, Dr. Teichman described how ORD develops its research program. He presented a chart that also illustrated how the BOSC and the Subcommittee fit into that process. The horizontal arrows on the chart describe ways that input is provided to the research program for planning as well as evaluating the program. This is a cyclical process (i.e., planning, evaluation, and revision), to be discussed later. The decision inputs are contributed by the program and regional offices, through Research Coordination Teams. Dr. Teichman emphasized that ORD views the program offices and regions as important customers for its work. Other inputs include EPA's *Strategic Plan*, the Administration's priorities (currently, climate change is one of those priorities), congressional mandates, and information from the BOSC, the SAB, the National Academy of Sciences (NAS), and other stakeholders. All of these groups provide input as ORD determines the research to conduct. There is an ORD Executive Council, which consists of the AA, the two DAAs, and all of the Laboratory and Center Directors, as well as two Office Directors. Dr. Teichman, as an Office Director, is a member of the Executive Council. ORD provides guidance to the NPDs concerning the overall balance of effort among areas, such as particulate matter, drinking water, global change, and others. The NPDs, Laboratory and Center Directors, and other individuals in the laboratories determine the research to be conducted in each arena and when it should be accomplished. The NPDs help determine the research priorities and timing, which are captured in the multi-year plans (MYPs).

The NPDs present their program plans to the ORD Executive Council, which reviews all of the proposals and makes some final decisions. Then, to implement the programs, the Laboratory and Center Directors determine which laboratories/centers and staff will accomplish the various tasks. When the work is completed, the products are delivered to the NPDs, who are responsible for providing the research results to the clients and for ensuring that the products are used effectively.

ORD seeks evaluation of this process from the program and regional offices, program evaluations such as this, and other groups (e.g., the NAS). The Office of Management and Budget (OMB) also provides feedback through its Program Assessment Rating Tool (PART) reviews.

Dr. Teichman described the logic diagram, which demonstrates how the research programs are developed. The right side of the diagram presents the desired long-term outcomes. These outcomes are achieved through intermediate and short-term outcomes, based on various policies developed in ORD. These policies are informed by research outputs that result from activities that start with resources allocated to the program. The research planning, therefore, works from right to left on the chart. Implementation of the program, however, works from left to right, beginning with the available resources, determining the appropriate research activities, and ensuring that those research outputs are delivered to the clients, who are responsible for developing policy. Dr. Teichman stressed that ORD seeks independent expert evaluation of its ability to accomplish its work effectively.

Dr. Teichman described the MYP as a planning tool. It identifies EPA's high-priority science questions and the goals that ORD must achieve to help inform EPA's goals and objectives. The MYP also provides a plan for communicating the research results beyond ORD. The MYP includes terms such as long-term goals (LTGs). Dr. Teichman noted that the science presented

during the upcoming face-to-face meeting likely will be oriented by LTGs. Within each LTG, there are annual performance goals (APGs) and outputs (i.e., annual performance measures [APMs], which are a subset of APGs). APMs are activities that enable ORD to accomplish an APG, and over time, accomplishing APGs leads to achieving the LTGs. The NPDs are responsible for preparing and updating their program's MYPs.

Program development is a cyclical process—planning, performing research, communicating research results, and evaluating performance in program reviews such as this. The BOSC program reviews are intended to answer two primary questions: “Are we doing the right science?” and “Are we doing the science right?” Dr. Teichman added that the program uses the Subcommittee's guidance to help the research program evolve and to help provide evidence for the PART review.

PART reviews evaluate a program's effectiveness in four areas: purpose/design, strategic planning, program management, and program results. The program receives a numerical score and a rating of effective, moderately effective, adequate, results not demonstrated, or ineffective. The results are based on annual and long-term performance goals, with an emphasis on outcomes. External program evaluations, such as this program review, are important in addressing the strategic planning and results sections of the PART. These sections evaluate whether the program has identified the right science to be done and whether the science was done well. The Subcommittee's assessments in those two areas are important.

PART reviews include specific research and development (R&D) criteria. These criteria require R&D investments to demonstrate relevance, quality, and performance.

The criteria for program relevance ensure that:

- ✧ The purpose of the program is clear.
- ✧ The program responds to a specific existing environmental problem related to EPA's mission, national priorities, and primary clients.
- ✧ The program demonstrates an outcome-oriented design.
- ✧ The program's benefits (e.g., contributions to outcomes) are unique or extend beyond similar government or private-sector contributions, and program coordination is effective in minimizing or preventing duplication.
- ✧ A small number of performance goals focus on scientific progress to answer key questions (or reduce uncertainty) linked to the program's outcomes.

The criteria for program quality ensure that:

- ✧ Merit-based procedures are used to ensure the program's scientific quality and leadership, and the program compares favorably to similar programs (e.g., in other agencies).

- ✧ When the program allocates funds extramurally (e.g., through assistance mechanisms), it ensures merit-based competition, relevance to the program's objectives, and independent review by subject matter experts.
- ✧ When the program allocates funds noncompetitively (e.g., to federal laboratories), appropriate merit-based procedures are used.
- ✧ The program may conduct benchmarking of scientific leadership and other factors as one of the means of assessing program quality.

The criteria for program performance ensure that:

- ✧ The program identifies relevant inputs (e.g., stakeholder guidance, human capital, research infrastructure) to ensure that implementation results in the intended research activities and outputs.
- ✧ The program demonstrates the ability to produce identifiable results:
 - Conceptual frameworks (e.g., risk paradigm, logic model) link research questions, performance goals, clients, and outcomes with a specific environmental problem.
 - Performance goals serve to answer key research questions and track how the program will improve scientific understanding and its application.
- ✧ The program periodically assesses research progress and priorities as new scientific knowledge is developed.
- ✧ The program demonstrates that it meets performance goals.
- ✧ The program obtains client feedback and demonstrates that progress is being made toward achieving the desired outcomes.

Dr. Teichman remarked that ORD seeks input from many sources to enhance and improve its research program. The BOSC program evaluations are one of its most important inputs, and he appreciates the Subcommittee's efforts.

Dr. Russell thanked Dr. Teichman for his presentation and introduced Dr. Scheraga.

Overview of the Global Change Research Program

Joel Scheraga, Ph.D., NPD, Global Change Research Program, NCEA, ORD, EPA

Dr. Scheraga thanked the Subcommittee members for their help and stressed the importance of their contributions. He presented an overview of key aspects of the Global Change Research Program and provided a context for the materials that the Subcommittee will receive. His presentation will be sent to the Subcommittee members after this conference call. Dr. Scheraga

discussed four topics: (1) the program's mission; (2) key characteristics of the program related to achieving the mission; (3) program planning, including the relationship of the planning process to the interagency CCSP; and (4) the program's commitments, progress, and accomplishments.

Program Mission

The Global Change Research Program has a well-defined mission. It is an assessment-oriented program, with a primary emphasis on understanding the potential impacts of global change on the United States. Beyond simply trying to understand impacts, the intent is to evaluate and inform decisionmakers and resource managers about possible adaptation options for responding to change over time. He emphasized that this is a global program, not just a climate change program. Although the program emphasizes climate variability and climate change, it is important to place climate change in the context of other important stressors on the environment (e.g., land use change and population change).

Within the area of impacts assessment, which is the broad mission, the program has defined focus areas that are consistent with EPA's mission as well as the expertise of its own scientists. The five focus areas are: air quality, water quality, ecosystems, human health, and place-based assessments (i.e., regional assessments). Place-based assessments are considered a logical way to integrate all of the focus areas. Decisions are made in specific places and vary from place to place. Dr. Scheraga emphasized that, like the rest of ORD, the program is outcome-oriented. The ultimate goal is to attain meaningful outcomes in the form of improvements to human health and the environment. Ultimately, the ability to influence outcomes (i.e., by providing scientific information and tools to decisionmakers) is contingent on the extent to which clients use the information in making decisions that affect environmental outcomes. Dr. Scheraga explained that the program is comfortable with this because it recognizes that policy and resource management decisions are inherently value-laden and based on multiple criteria and pieces of information. He added that the program is careful not to "cross the line" between its job—which is to provide timely and useful information to inform decisionmaking—and what is not its job—which is to become involved in the making of policy and decisions or even policy recommendations. He commented that he hopes that the Subcommittee will evaluate the extent to which the program is establishing processes and providing the types of information and tools that will increase the ability of decisionmakers to achieve improved environmental outcomes.

The Global Change Research Program does not address issues related to the mitigation of greenhouse gas emissions. It focuses on impacts and adaptation, but not on mitigation. This is dictated by the CCSP and by restrictions from Congress. There is, however, other climate-related work at EPA, distinct from this research program, notably in OAR, that focuses on greenhouse gas mitigation and energy efficiency issues.

Key Program Characteristics

The program's first key characteristic is that it is stakeholder-oriented. This is consistent with recommendations from the National Research Council (NRC). Dr. Scheraga explained that engagement with stakeholders is necessary to meet the goal of providing them with timely and

useful information. Stakeholders are involved from the outset in identifying the problems they need to have addressed, the timeframe in which information is needed, and how information will be used. Stakeholders sometimes choose to become involved in the research and assessment work; they often have expertise that the program does not have. The program relies on them and works with them to communicate the results. The program also relies on stakeholders to use the information in decisionmaking.

The program's most immediate clients are the program offices, particularly OAR and OW, as well as the Office of International Affairs and several regional offices, which help conduct work in particular locations. Clients beyond EPA include decisionmakers in various regions, states, and localities, and the program is learning how to identify these clients better as it evolves. The CCSP is a major client, as is the academic community. In addition to sponsoring research in the academic community, an important goal and outcome of this program is to build the next generation of scientists. To do this, the program sponsors American Association for the Advancement of Science (AAAS) Fellows and hires postdoctoral fellows (some of whom will present to the Subcommittee in the weeks ahead).

The second key characteristic is how the research is accomplished. The program leverages and integrates intramural research done in ORD laboratories and centers with extramural research conducted in the academic community through grants and cooperative agreements. Intramural research is focused on developing well-defined scientific information and tools that are necessary for conducting assessments. Approximately one-third of the budget supports extramural research through the STAR Program. It is important to capitalize on expertise in the academic community that the Global Change Research Program lacks. The STAR Program also helps to lay the foundation for future assessments and to address emerging issues. Dr. Scheraga commented that intramural and extramural activities are carefully integrated, and the Subcommittee soon will receive a description of these activities. Dr. Scheraga noted that much research is conducted through joint Requests for Applications (RFAs) with other federal agencies. For example, for many years the program had a joint health solicitation with NOAA, the National Aeronautics and Space Administration (NASA), NSF, and the Electric Power Research Institute (EPRI) from the private sector. Most recently, a joint solicitation was issued with DOE that focuses on climate change and ecosystem thresholds. Dr. Scheraga emphasized the importance of partnering with other agencies.

Program Planning

The Global Change Research Program's *Research Strategy* is an externally peer-reviewed, long-term research plan that provides the vision for the program. It was developed in 2000, peer-reviewed externally in February 2001, and revised and completed in December 2001. The purpose of this process is to ensure that the right work is planned. The *Research Strategy* now is 4 years old and somewhat dated (i.e., some of the interagency activities to which it refers have evolved, especially with changes in administrations); however, the research and assessment LTGs still are relevant. The Subcommittee members will receive copies of this document.

An MYP for the Global Change Research Program also was developed. This document essentially is the business plan; it describes how the vision that is outlined in the *Research*

Strategy will be implemented. The MYP is more of a “living” document than the *Research Strategy*. It is updated continually (e.g., APMs are revised) as we learn to perform the work more effectively. Copies of the MYP will be sent to the Subcommittee members.

CCSP

In 1990, Congress passed the Global Change Research Act, which created the USGCRP. The intent was to establish an entity that would be responsible for coordinating research on global change across the federal government. There now are 13 different member agencies and departments involved in this program. In 2001, the Bush Administration created the CCSP, which includes the base program activities of the USGCRP and some new activities called the President’s Climate Change Research Initiative. EPA is a member agency of the CCSP.

EPA has one of the smallest budgets of all of the agencies involved in this work—approximately \$20 million within a larger, \$1.9 billion CCSP program. Much of the CCSP budget, however, includes funding for NASA’s satellite hardware. Because EPA has a small budget, much of which goes to salaries, it is important to focus on a specific, well-defined niche within the program, and to leverage with other agencies’ programs. EPA’s focus is on impacts and adaptations to climate change; it leverages with agencies, such as NOAA, that focus on impacts and adaptations to climate variability. It also is important to manage the budget effectively. Since 1998, as the USGCRP has evolved, EPA’s program has become more assessment oriented. It has been a leader, along with agencies such as NOAA, in the movement within the entire CCSP toward basic research with more of an emphasis on assessment and, now, on providing decision support to stakeholders. For example, EPA was a leader in the production of the first *U.S. National Assessment of the Potential Consequences of Climate Variability and Change* that was delivered to Congress in 2000. It also supported regional assessments that many of the agencies sponsored. The Subcommittee members soon will receive copies of these reports as evidence of EPA’s contribution. They also will receive copies of *Our Changing Planet*, the CCSP’s annual report to Congress, which provides an overview of the different agencies’ responsibilities and budgets within the CCSP and a sense of how the agencies have worked together to form an integrated program.

The CCSP has a strategic plan, which was released in 2003 and reviewed by the NRC. Copies of this document will be sent to the Subcommittee members so that they can compare it to the Global Change Research Program’s *Research Strategy*. This plan, although it was developed 2 years prior to the CCSP plan, is consistent and closely coordinated with the CCSP Strategic Plan. Some of EPA’s annual commitments are tied to commitments made in the CCSP Strategic Plan. For example, the CCSP Strategic Plan commits member agencies to producing 21 synthesis and assessment reports, to which Congress currently is paying much attention. These can be described as mini-assessments that focus on the highest priority research questions being addressed by the CCSP to inform decisionmakers. EPA is the lead agency for three of these reports and has contributed to seven others. When EPA’s *Research Strategy* was written in 2001, these 21 reports had not been conceived. The Global Change Research Program was flexible and dynamic enough, however, that EPA could commit to producing several of these reports, which will be based largely on work being conducted in the Global Change Research

Program as well as on work being done in related programs in other agencies, such as the U.S. Department of Agriculture (USDA) and NOAA.

Commitments and Accomplishments

Dr. Scheraga explained that he would provide only a brief overview of the Global Change Research Program's commitments and accomplishments, because the Subcommittee members will receive narrative descriptions for each focus area and additional evidence of accomplishments in those areas. He described this overview as a roadmap to the materials that they will receive.

In the area of air quality, the Global Change Research Program has committed to produce, by 2010, a final air quality assessment that will address the question: "What is the effect of global change on air quality across the United States?" Dr. Scheraga emphasized that this is global change, not just climate change. The program also plans to produce, by 2007, an interim assessment that focuses on the partial effects of climate change on air quality across the United States. This effort is somewhat unique in the federal government because it focuses on the effects of climate change on air quality rather than the effects of air quality on climate change, which other agencies, such as NASA and DOE, address.

The Global Change Research Program has had major successes in this area. For example, in partnership with DOE's Battelle National Laboratory, it completed the meteorological downscaling that was necessary for conducting the air quality assessment. Also, through the STAR Program, working with the University of Arizona, a Web-based decision-support tool for wildfire management was developed, which also has implications for air quality.

In the area of water quality, the program has committed to completing a series of assessments. First, by 2005, it will address the question: "What is the effect of global change on pollutants and microbial pathogens?" The program will examine issues relevant to EPA's mission (e.g., drinking water infrastructure, wastewater treatment, and pollutants and pathogens in surface waters, which relate to EPA's Total Maximum Daily Loads [TMDL] program). By 2007, in partnership with OW, the Global Change Research Program will enhance OW's publicly available basins model, which is a decision-support tool, so that water resource managers throughout the United States can incorporate considerations of climate variability and change into water management decisions. Finally, by 2008, the program will have completed an evaluation of the consequences of global change for water quality related to biocriteria.

The Global Change Research Program has made some progress in this area as well. Several assessments have been completed, including an assessment of risks posed by sea-level rise to selected public water supply systems in coastal areas that rely on surface water. The program also identified groundwater supplies in Florida that are vulnerable to sea-level rise; this assessment also was done for Region 4. An assessment of the implications of climate change for combined sewer overflow events in Great Lakes cities was completed. This also was done for Region 5.

In the area of ecosystems, by 2006, the Global Change Research Program has committed to completing an assessment of the effects of climate change and land use change on aquatic ecosystems, including adaptation options at selected locations for key aquatic systems (e.g., coral reefs and estuaries). After this, the program will examine the effects of global change on ecosystem services and then on invasive species. Some progress has been made in these areas. Dr. Scheraga highlighted an example in which the program made a difference in terms of process. Some essential processes were established in key places (e.g., the San Francisco Bay watershed) to partner with stakeholder groups to: (1) identify their information needs and the timeframe within which they need the information, (2) work with them to conduct the research and assessments, and (3) deliver the insights derived from these assessments. The program also developed a watershed yield calculator as part of a Sierra Nevada watershed project that is intended to help managers evaluate the effects of climate change and vegetation management on base flow and in-stream flow.

In the area of human health, the program produced the first health sector assessment for the United States as part of the U.S. National Assessment. This was the program's first major commitment and success; copies of this will be sent to the Subcommittee. Next, the program committed to conduct a second round of assessments, based on lessons learned from the first assessment. This round of assessments is being initiated through the STAR Program. These assessments will focus on filling key research gaps in the areas of weather-related morbidity and vector- and water-borne diseases, which were identified in the first assessment. The program also is initiating a set of assessments to learn more about the decision-support needs of the public health community.

In the area of place-based assessments, the program's first commitment was to produce three regional assessments, as part of the U.S. National Assessment, in the Great Lakes, Mid-Atlantic, and Gulf Coast regions. The program succeeded in doing that, and copies of these assessments will be sent to the Subcommittee. The program has initiated the second round of regional assessments in those regions, each of which focuses on different key issues related to that region. The second round Gulf Coast assessment also is focused on questions about decisionmakers' needs for climate information and how they use that information.

Dr. Scheraga described the program's next commitment as advancing the science of decision support. This is related to the dynamic nature of both the Global Change Research Program and the USGCRP. One of the lessons learned over the past few years is that producing assessments cannot be presumed to result in better environmental outcomes. The goal now is to learn how to engage in new activities that lead to better-informed management and policy decisions and improve both societal and environmental outcomes. In the same way that EPA was a leader within the CCSP in the area of assessment, the Global Change Research Program would like to be a leader, along with NOAA, in the area of decision support. The focus will be on adaptation as the bridge from the impacts research and assessments to the decision-support arena. As an example of new activities, the Global Change Research Program, in partnership with NOAA, hopes to sponsor an NRC study that will lead to a better understanding of what effective decision support entails and how to evaluate that effectiveness. The Global Change Research Program also is beginning to develop a dynamic decision inventory to identify different classes of climate-sensitive decisions in various regions of the country. This will help evaluate the returns from

providing better scientific information to inform those decisions. The Subcommittee will receive a narrative overview specifically about this activity.

Dr. Scheraga reiterated that the Subcommittee members would receive a more detailed, written version of his presentation. He added that he has offered, through the DFO, to provide the Subcommittee with background information as evidence to support the statements he has made. He would like to document for the Subcommittee the type of ongoing work, the way the work is being performed, the progress in each area, and the accomplishments, as well as the value to the program's clients. He thanked Dr. Russell and recommended that the Subcommittee members ask, through the DFO, for any additional information they might need in preparing the program review.

Dr. Russell thanked Dr. Scheraga for his presentation. He asked if the Subcommittee members had any questions, and there were none.

Discussion of the Charge Questions

Milton Russell, Ph.D., Chair, Global Change Subcommittee

Dr. Russell introduced the discussion of the charge questions. He indicated that he had sent out a lengthy e-mail describing the Subcommittee's charge, including the specific charge questions, and his thoughts about how to proceed with the report.

Dr. Russell noted that the charge questions are relatively clear; they explain the motivation for the Subcommittee's work and the audiences for the report. The motivation for the work revolves around two themes: whether the Global Change Research Program is doing the right work, and whether it is doing it well. The charge questions also indicate that, to be useful, the report must address several audiences. This leads to the question of what those audiences would find useful and what the Subcommittee can do to move the process forward.

Dr. Russell asked Dr. Duke to comment on the charge questions. Dr. Duke provided some background, based on his experience as a reviewer of previous reports and his observations of other subcommittees as they organized and developed their reports. He noted that, with each of these programs, there are many crosscutting areas (e.g., LTGs, focus areas, and the charge questions). Each subcommittee has worked hard to determine the most effective organization for these reports, which, he explained, is within the prerogative of the subcommittees. The Executive Committee will recommend changes in the draft report, but each subcommittee has had to address this organizational question. He complimented Dr. Russell's distillation, which also was reflected in Dr. Teichman's presentation, that the issue is whether the program is doing the right work and whether it is doing it well. He added that it would be beneficial to consider the most succinct and thoughtful way to organize the report. He considered the charge questions to be a first attempt at that process.

Dr. Russell opened the discussion to the Subcommittee members. Dr. Balbus commented that the two overarching questions are very large, especially the first question, of whether the Global Change Research Program is engaged in the right work. The charge questions are fairly specific, and seem to put that question in the context of the program's mission, which Dr. Scheraga stated

in his presentation, and the goals of ORD. Dr. Balbus stated that it seemed a little circular. He wondered if the Subcommittee members were expected to suggest other kinds of work that could be done, based on their own judgment or comparisons to other programs.

Dr. Russell responded that the Subcommittee should not define a different mission, but should ask whether the research, priorities, and emphases meet the mission of the program. It is important, therefore, that the mission be understood clearly. The audiences in the Executive Branch, the Congress, and the professions are most interested in the question of whether the program is “doing the right work.”

Dr. Coutant commented that he expects a fair amount of confusion to surround the question of “right work,” and concerning who is doing what. There may be confusion about whether EPA or other agencies, such as DOE or NOAA, are doing particular pieces of the work. The Subcommittee needs to understand clearly the niche that EPA has carved out for itself in relation to the other agencies. Dr. Russell agreed and added that this would help Dr. Scheraga and his staff to determine what information to gather for the Subcommittee.

Ms. Nierenberg commented that, based on her experience with similar processes at NOAA, Drs. Duke and Balbus have identified the key issue, which is connected to audience. The Earth Science Program faced a similar question of whether it was conducting the right work in the context of a large interagency program or in the context of supporting environmental challenges and how those are articulated back to the program.

Dr. Russell added that the Subcommittee will be held accountable for the charge questions, but its own efforts and actions can be adjusted according to the needs of the report. The charge questions, therefore, are not necessarily constraints, but guideposts for Subcommittee operations. Dr. Gamble agreed, and Dr. Duke added that, typically, subcommittees focus on the charge questions as a source of guidance, but they are free to make additional comments.

Dr. Coutant asked whether the Executive Committee prefers to see the questions answered explicitly. Dr. Duke replied that the reviewers examine the charge questions and determine whether the Subcommittee has responded to them. He explained that the Subcommittee has the freedom to organize the report as it deems appropriate, but the Executive Committee will want an explanation if the charge questions are not answered. His experience is that Dr. Johnson and the other reviewers focus on those issues. It is important, therefore, to answer the questions, whether or not the report is organized around them explicitly.

Ms. Nierenberg asked about the bullets under the first two questions and whether the Subcommittee could suggest amendments to them. Dr. Russell explained that the bullets were an expansion of the charge questions. If the Subcommittee finds that it cannot answer certain questions, it can omit them and note that for the Executive Committee. He added that the report should be useful to its audiences, and one description after another could be difficult to read. Audiences who are concerned with the general operation of the program might prefer a discursive first section that presents the wisdom of the program, with a more detailed section later that responds to the charge questions and is organized around topic areas.

Dr. Russell stated that he understood this to be an acceptable approach to the development of the report. It would serve the multiple audiences, including the generalists who want to know what the program is about, as well as those who want specific evaluations of particular issues. Dr. Gamble commented that this was consistent with her understanding from talking to Dr. Johnson. She pointed out the wording in questions 1 and 2, “the Committee may consider a number of questions ...” and “... may consider a subset of more specific questions.” She described these as “loophole phrases” for the Subcommittee to handle as it considers appropriate. Dr. Duke agreed with Dr. Gamble that the phrasing provides some leeway. He added that the Subcommittee should be careful to indicate in the report why it has chosen to emphasize certain subsets of questions and why others might have been omitted. Dr. Russell agreed that this sounded reasonable.

Dr. Coutant asked about the logistics of organizing the writing of the report. He commented that the Subcommittee includes a variety of distinct disciplines that align, to a certain degree, with the different focus areas, and most of the charge questions are crosscutting. He also asked about the timeframe for determining writing assignments and working on the report. Dr. Russell replied that the Subcommittee is under a time constraint and, by the next scheduled conference call, the report should be in progress. He added that another conference call could be scheduled, if necessary.

Dr. Coutant asked about examining the charge questions by focus area. Because the stakeholders are different, the same question might look different from the perspective of different focus areas. Dr. Russell agreed and added that some questions may or may not be relevant within different focus areas. He did not consider that to be a problem. Dr. Coutant commented that to approach the report from a focus area perspective, either everyone would address every question, or a representative from each focus area would examine each question, to which Dr. Russell agreed.

Dr. Wilkinson asked how this process relates to processes at other organizations, such as the Intergovernmental Panel on Climate Change (IPCC), and how the Subcommittee should benchmark against similar efforts. Dr. Scheraga replied that the CCSP, in developing its agenda, tries to reflect key research and assessment questions that are raised in the international community as well as the U.S. science community. There is a two-way flow of information, not just with the IPCC, but with other organizations such as the World Health Organization, UNEP, and others. This two-way flow of information includes insights about the “right issues,” which are shared with those organizations. Several authors and representatives from the federal government participate in the IPCC process, but the CCSP also is responsive to the deliberations within the IPCC and other organizations as it identifies the right research questions. It is a dynamic process. Dr. Scheraga added that, in areas such as decision support, which is an emerging area, he hopes that EPA and the federal government will have some influence on the IPCC.

Dr. Russell summarized this part of the discussion and asked if the Subcommittee would concur. The Subcommittee should not second-guess the total science program for global change, nor should it address policy issues. It is reviewing a relatively small piece of the overall research effort, which was described earlier, and determining what it is doing and what it is trying to do.

The Subcommittee should determine whether the Global Change Research Program, within its given mission, has established the appropriate priorities, moved ahead in the right kinds of work, and conducted the work well. The Subcommittee is not asked, nor does it have the responsibility, to raise larger questions about whether the program should engage in work other than that with which it has been charged.

Ms. Nierenberg agreed with Dr. Russell's summary. She added that there seemed to be an implied question within the first two questions about how well the program course-corrects or evolves. The Subcommittee might consider this as it discusses how well the Global Change Research Program is responding to its mission. Dr. Russell agreed and suggested that the group proceed with its agenda; the Subcommittee members agreed.

Subcommittee Organization

Milton Russell, Ph.D., Chair, Global Change Subcommittee

Dr. Russell began the discussion of how to organize the writing of the report, which he described as a daunting task. He explained that everything must come together very quickly, considering there is only one face-to-face meeting, which will occur in less than 2 months. After the face-to-face meeting, there is a short amount of time to finish the report and put it in final form for the Executive Committee's review. Dr. Russell presented his vision for organizing the report. He suggested dividing into workgroups to address the topic areas, while keeping the broader crosscutting questions for the Subcommittee to handle as a group. His vision for the final report included an executive summary that would provide the Subcommittee's basic conclusions, wisdom about the crosscutting issues, and a roadmap to the resources. Chapters on the focus areas would discuss the activities and the results of those activities that are of particular interest to the program's management, the scientific community, and outside stakeholders. Dr. Russell suggested a report in three parts: an executive summary, the crosscutting wisdom issues, and the chapters on the specific focus areas. He added that he prefers to begin with an idea of the final product and then determine how to accomplish it.

Dr. Russell explained that the chapters would serve several purposes: (1) to give Subcommittee members an intensive introduction to the topic areas; (2) to provide substantive input into the crosscutting issues, which will appear in the front of the report (i.e., the evaluation); and (3) to serve as a stand-alone review of specific areas for management and others. He added that the chapters are a major product and will require significant attention.

Dr. Russell asked for comments. Dr. Balbus mentioned that he was concerned about the large amount of work and the short amount of time. He had not been informed that he was responsible for delivering substantial work products before the face-to-face meeting. He suggested that, given the short time frame, the Subcommittee should be careful not to take on more than it can handle. He supported the model of chapter organization that Dr. Russell presented and asked if drafts would be written before or during the face-to-face meeting. Dr. Russell replied that he also was concerned about the amount of work to be done in the short time frame. He asked Dr. Gamble to respond, and he asked Dr. Duke about the number of pages expected in the report, which would indicate the kind of intensity that the BOSC is expecting.

Dr. Gamble replied that the Chair and the Subcommittee are responsible for determining the process and setting the milestones for writing the report. Dr. Russell explained that he was reacting to the statement that he had received earlier, which he was able to get changed, that a draft report would be available at the end of the face-to-face meeting. He had concluded that such a timeframe seemed impossible, but a substantial piece could be ready by that time. To be feasible, much of the writing would have to be done before the face-to-face meeting, rather than during or after it.

Dr. Duke offered his observations of other subcommittees. He emphasized Dr. Gamble's point that the process and milestones are within the prerogative of the Subcommittee. Some groups have done much of the work during the face-to-face meetings; others have done more of the work outside, either on their own or in small workgroups (in accordance with FACA regulations). Dr. Duke added that the other subcommittees' reports have been approximately 30-50 pages, single-spaced, with large fonts (i.e., 12 point). He did not think there were any requirements in regard to length; this was affected by factors such as individual writing styles. Typically, the reports have included a full, verbatim reporting of the charge questions, either as an appendix or as an organizing principle, and a list of subcommittee members. Dr. Russell commented that this suggests a fairly substantial report, not six or seven pages. Dr. Duke replied that the executive summary usually was about that length.

Dr. Balbus remarked that the agenda for the face-to-face meeting includes a significant amount of time for poster and staff presentations. Before that meeting, however, the Subcommittee members will need to gather and read much of this information. He recommended more face-to-face meeting time for responding to the charge questions. Dr. Russell asked if he meant less time for presentations and more time for Subcommittee deliberations. Dr. Balbus suggested that as a starting point. As the Subcommittee members gather information, they can determine any additional presentations that might be required.

Dr. Russell remarked that he also was concerned about the limited deliberation time at the face-to-face meeting. He suggested that the Subcommittee members work ahead of time on substantive issues within the chapters. The deliberative time could be used to draw conclusions about the Global Change Research Program as a whole—its operations, leadership, and general direction. He did not think they could expand the time available for deliberations, but he asked Dr. Gamble to comment.

Dr. Gamble replied that the activities of the face-to-face meeting are determined by the needs of the Chair and the Subcommittee. The proposed activities are similar to those of previous BOSC reviews; however, if this group needs to organize differently to function more effectively, then that will be done. Dr. Russell asked when the agenda for the face-to-face meeting had to be finalized. Dr. Gamble answered that it must be posted a week before the meeting; however, more time is required for inviting presenters, developing presentations, and making travel arrangements. Dr. Russell asked if the end of August would be a reasonable amount of advance notice. Dr. Gamble replied that it might be problematic in terms of travel. Deadlines are involved with hotels and air travel, and plans would need to be finalized by the middle of August. Dr. Russell suggested that they table this issue. Because it is a procedural matter, it can be discussed via e-mail among the Subcommittee members, outside of the public meeting forum.

He added that Dr. Balbus has raised a serious issue that also has troubled him from the beginning.

Dr. Coutant commented that the presenters like their perspectives to be heard (i.e., to ensure that information is not fed to the Subcommittee solely by those outside the program). For that reason, he thought it would be important to hear their presentations. Dr. Russell replied that this sounded wise. He had discussed this necessity with Dr. Gamble, as well as the necessity of hearing from stakeholders.

Dr. Balbus mentioned that perfunctory presentations can be irrelevant at times, and it might be more useful to engage the staff in discussion. He suggested that the Subcommittee could provide the staff with a set of questions to discuss informally. He has heard presentations that presented a staff point of view, but were not relevant to the questions that needed to be answered. Dr. Russell concurred. Dr. Duke commented that other review committees have found these presentations to be very useful. He also recognized the tight schedule, but noted that it was not unprecedented.

Dr. Russell stated that discussion about the agenda for the face-to-face meeting and the organization of the report would continue by phone and e-mail in the next week, and the Subcommittee would give Dr. Gamble guidance pertaining to the face-to-face meeting. Dr. Russell proceeded with the discussion of writing the report, and suggested the following roles for each of the topic areas.

Topic	Primary Lead	Associate Lead	Coordinator
Air	Dr. Reck	Dr. Balbus	Dr. Russell
Water	Dr. Wilkinson	Dr. Coutant	Dr. Duke
Ecosystems	Dr. Coutant	Dr. Reck	Dr. Duke
Health	Dr. Balbus	Ms. Nierenberg	Dr. Duke
Regional (Place-Based Assessments)	Ms. Nierenberg	Dr. Wilkinson	Dr. Russell

Subcommittee members who were present on the conference call agreed to these roles, and Dr. Gamble offered to inform Dr. Reck, who was not present on the call. A confirming e-mail will be sent in the next few days as well. Dr. Russell encouraged the Subcommittee members to share any comments or concerns they might have on these issues.

Public Comments

Janet Gamble, Ph.D., NCEA, ORD, EPA

Dr. Gamble explained that the meeting was open for public comment at this point. Any members of the public who wished to speak should identify themselves. They would be allotted 3 minutes each. No members of the public asked to speak.

Administrative Procedures

Janet Gamble, Ph.D., NCEA, ORD, EPA

Dr. Gamble will send forms to the Subcommittee members to assist them in making hotel and airline reservations for the face-to-face meeting in September. EPA will make airline reservations for the Subcommittee members after they provide information about time and locations, and the Subcommittee members will make their own hotel reservations. Dr. Gamble will send a reminder and a form for homework hours. Subcommittee members are required to keep a record of hours spent on Subcommittee activities, such as reading, writing, or other preparation for the meeting or the report. Dr. Gamble will keep a log for each member regarding travel time and time spent on conference calls or in meetings. The two logs will be combined, and she will work with personnel to ensure that the Subcommittee members are paid. She thanked the members for their participation.

Wrap-Up

Milton Russell, Ph.D., Chair, Global Change Subcommittee

Dr. Russell asked for comments, and Dr. Balbus asked him to clarify the next steps. Dr. Russell replied that there will be some correspondence about the results of this conference call and opportunities for the Subcommittee members to comment and come to a firm agreement about what has been decided. A large amount of material will be sent to help prepare for the next meeting. After reviewing this material, the Subcommittee members may request additional materials from Dr. Gamble.

Dr. Russell added that he anticipates a need for an additional conference call sometime before September 13. Dr. Gamble remarked that it could be problematic. The conference calls are public meetings and are required to be posted in the *Federal Register* 15 calendar days before the meeting. The process for EPA to post these notices requires another 6 or 7 days. Therefore, if another call is necessary, the timeframe in which to plan it is very short. Dr. Russell thanked Dr. Gamble for that clarification and stated that the Subcommittee members would discuss this and make a decision in the next few days. Another conference call would not be possible before August 28.

Dr. Russell thanked the Subcommittee members and commented that it had been a very long and useful meeting. He adjourned the conference call at 12:17 p.m.

Action Items

- ✧ Dr. Scheraga will send copies of his presentation to the Subcommittee members.
- ✧ Dr. Scheraga will send copies of the Global Change Research Program's *Research Strategy*, the MYP, the CCSP's Strategic Plan, the CCSP's Annual Report to Congress, the *U.S. National Assessment of the Potential Consequences of Climate Variability and Change*, the three regional assessments, the decision inventory, and other documents to the Subcommittee members.

- ✧ The Subcommittee members will decide whether to schedule a conference call before the face-to-face meeting and inform Dr. Gamble of their decision.
- ✧ The Subcommittee members will discuss the agenda for the face-to-face meeting and the organization of the report by phone and e-mail. They will provide guidance to Dr. Gamble pertaining to the face-to-face meeting.
- ✧ Dr. Gamble will inform Dr. Reck about writing assignments for the report and will send a confirming e-mail about the assignments within the next few days.
- ✧ Dr. Gamble will send forms to the Subcommittee members to assist them with hotel and airline reservations for the face-to-face meeting.
- ✧ The Subcommittee members will provide Dr. Gamble with information pertaining to travel times and locations, after which EPA will make airline reservations for the face-to-face meeting.
- ✧ The Subcommittee members will make their own hotel reservations for the face-to-face meeting.
- ✧ Dr. Gamble will send the members a reminder and a form for recording homework hours. The Subcommittee members will record hours spent on Subcommittee activities. Dr. Gamble will track the hours spent in conference calls and meetings. She will work with EPA personnel to ensure that the Subcommittee members are paid.

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APPENDIX

Conference Call Agenda

Agenda

U.S. Environmental Protection Agency Office of Research and Development BOSC Global Change Subcommittee

Conference Call

Thursday, August 4, 2005, 10 a.m.–12 noon EDT

10:00 a.m.	Welcome	
	- Introduction of Subcommittee Members	Subcommittee Chair
	- Purpose of BOSC Program Review	Subcommittee Vice-Chair
10:15 a.m.	Overview of Federal Advisory Committee Act (FACA)	Dr. Janet Gamble (ORD) Designated Federal Officer
10:30 a.m.	Overview of ORD	To Be Determined
10:45 a.m.	Overview of the Global Change Research Program (GCRP)	Dr. Joel Scheraga National Program Director
11:15 a.m.	Review of BOSC Charge Questions	Subcommittee Chair
	- Discussion of Charge Questions	Subcommittee
11:30 a.m.	Subcommittee Organization	Subcommittee Chair
11:45 a.m.	Public Comments	
11:55 a.m.	Administrative Procedures and Action Items	Dr. Gamble